

REVIEW - QUADRATIC FUNCTIONS

1. Circle all of the following functions that are quadratic functions.

$$y = -\frac{1}{2}x + 3$$

linear
not quadratic

$$y = 8x^2 - 7$$

$$y = x^2$$

$$y = 9x^3 - 5x^2 + 2$$

x^3 is cubic
not quadratic

$$y = -6(x+1)^2$$

2. Consider the function $y = 4x^2 - 24x - 7$

A. Find the y-intercept $f(0) = 4(0)^2 - 24(0) - 7 = -7$ $(0, -7)$

- B. Will the vertex be a maximum or a minimum? Why?

- C. Find the vertex.

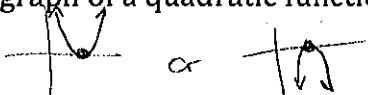
a is positive \uparrow min
(concave up)

$$x = \frac{-b}{2a} = \frac{-(-24)}{2(4)} = 3 \quad f(3) = 4(3)^2 - 24(3) - 7 = -43 \quad \boxed{(3, -43)}$$

3. List all the other names for "solutions" of a quadratic function.

roots, zeros, x-intercepts

4. Sketch the graph of a quadratic function that has *exactly one* solution.



5. What does the value of the discriminant tell you about your function if it is

a. positive

b. negative

c. zero

2 real solutions

no real solutions

One real solution

6. Why do you need to set $y=0$ before you start finding solutions?

Solutions are the points on the graph where $y=0$

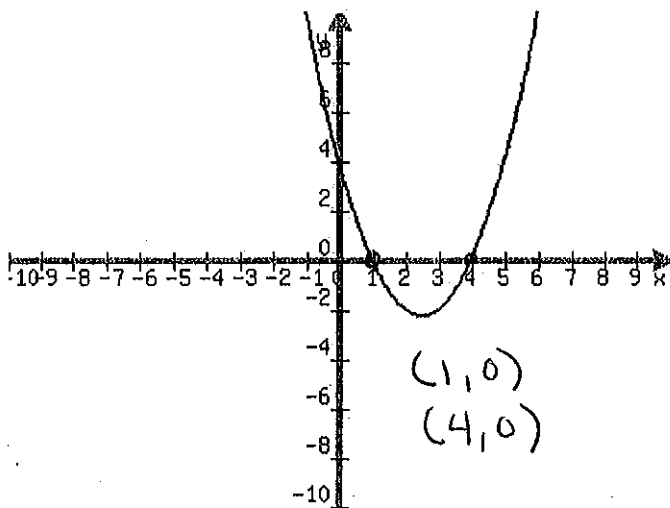
7. Find the solutions of $\frac{6x^2}{6} = \frac{150}{6}$

$$\sqrt{x^2} = \sqrt{25}$$

$$x = \pm 5$$

$$(-5, 0) \text{ and } (5, 0)$$

8. State the solution(s) of the quadratic function based on the graph.



9. Find the solutions of $9x^2 = 4x$ by factoring. SHOW ALL WORK.

$$9x^2 - 4x = 0 \quad x(9x - 4) = 0 \quad \Rightarrow \quad x = 0 \quad \text{or} \quad 9x - 4 = 0$$

10. Find the solutions of $y = x^2 - 6x - 7$ by factoring. SHOW ALL WORK.

$$(x-7)(x+1) = 0 \quad x-7=0 \quad \text{or} \quad x+1=0$$

$$\boxed{x=7 \quad x=-1}$$

$$\frac{9x}{9} = \frac{4}{9} \quad x = \frac{4}{9}$$

11. State the quadratic formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

12. Find the solutions of $y = -2x^2 + 6x + 5$ using the quadratic formula. SHOW WORK.

$$a = -2 \quad b = 6 \quad c = 5$$

$$x = \frac{-6 \pm \sqrt{76}}{-4} \quad x = -.68, 3.68$$

Separate sheet

13. Find the solutions of $f(x) = 3x^2 + 2x + 7$ using the quadratic formula. SHOW WORK.

$$a = 3 \quad b = 2 \quad c = 7$$

$$x = \frac{-2 \pm i\sqrt{80}}{6} = \frac{-1 \pm 2i\sqrt{5}}{3}$$

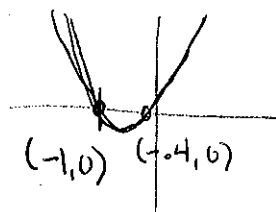
Separate sheet

14. Find the solutions of $x^2 + 7x = -10$ using the method of your choice. SHOW WORK.

$$x^2 + 7x + 10 = 0 \quad (x+5)(x+2) = 0 \quad x+5=0 \quad x+2=0$$

$$\boxed{x=-5 \quad x=-2}$$

15. Find the solutions of $y = 5x^2 + 7x + 2$ using the method of your choice. SHOW ALL WORK.



by graphing

$$b^2 - 4ac = 7^2 - 4(5)(2) = 49 - 40 = 9$$

$$x = \frac{-7 \pm \sqrt{9}}{2(5)} = \frac{-7 \pm 3}{10}$$

$$\frac{-7+3}{10} \quad \frac{-7-3}{10} = \frac{-10}{10}$$

$$\boxed{x = \frac{-4}{10} = -.4 \quad = -1}$$

$$12) \quad b^2 - 4ac = 6^2 - 4(-2)(5) \\ = 36 + 40 = 76$$

$$x = \frac{-6 \pm \sqrt{76}}{2(-2)} = \frac{-6 \pm \sqrt{76}}{-4}$$

$$\frac{-6 + \sqrt{76}}{-4}$$

$$\frac{-6 - \sqrt{76}}{-4}$$

$$x = -.68$$

$$x = 3.68$$

$$13) \quad b^2 - 4ac = 2^2 - 4(3)(7) \\ = 4 - 84 = -80$$

$$x = \frac{-2 \pm \sqrt{-80}}{2(3)} = \frac{-2 \pm i\sqrt{80}}{6}$$

$$\begin{array}{r} 80 \\ 4 \overline{) 20} \\ 4 \overline{) 5} \end{array}$$

$$= \frac{-2 \pm 4i\sqrt{5}}{6} = \frac{-1 \pm 2i\sqrt{5}}{3}$$